

Staphylococcal infection was considered to have been a contributory cause of death in 41 patients of the hospital series of 470 (8.6%). Only 2 of these were children and only 4 under 50 years old; yet in the total series of necropsies 99 of the patients were below that age. The authors do not discuss age as a factor in liability to hospital-acquired infection, but these figures suggest it is important—that in fact the victims are in the main old or elderly and debilitated by other disease. Thirty of these 41 infections fall into a single category—staphylococcal pneumonia. Of the remaining 11 two were admitted with staphylococcal septicaemia, leaving 9 infections acquired in hospital, comprising one each of septicaemia, meningitis, empyema, and generalized dermatitis, and 5 of post-operative enterocolitis following treatment with a broad-spectrum antibiotic.

For the 30 patients with staphylococcal pneumonia the disease was evidently in most cases a terminal event from which recovery was not to be expected. The authors admit a very natural uncertainty about the responsibility of staphylococci for some of these infections. There were 96 pneumonias in all, and staphylococci were recovered from the lungs of these 30, but they were also found in the lungs of 92 other patients without pneumonia. This total of 122 (26%) contrasts with the finding of staphylococci in the lungs of only 6 (4.8%) of those brought in dead. This is the most novel finding in the survey, and suggests that patients in hospital are liable to become “bronchial carriers” of staphylococci in the ward. These organisms were phage-typed, and many belonged to types such as 80/81 with a high capacity for spread: most of them were also tetracycline-resistant. It would be interesting to know whether this invasion of the bronchi is a terminal phenomenon, occurring only when secretion begins to accumulate, or whether the organism can establish itself in a relatively normal bronchial tree.

How these findings should be interpreted depends in part on the structural merits and standards of medical and nursing care in the hospitals in which the survey was conducted. Provided they represent a fair cross-section of hospitals in this country, the results are reassuring. The frequency of staphylococcal infections in hospitals has been increasing throughout the world. D. E. Rogers¹ recounts his experience of it in the New York Hospital, and M. Finland and his colleagues² present an even more alarming picture of the rise in frequency of both staphylococcal and coliform infections at the Boston City Hospital, mentioning that death from septicaemia has been commoner recently than it was in 1935. These authors point to one reason for it—the deterioration in patients’ resistance owing to greater age, more radical surgery, more drastic radiotherapy, and treatment with corticosteroid and antimitotic drugs. Rogers also lays a large share of the blame on indiscriminate antibiotic treatment, especially for prophylaxis.

A remark in Rogers’s paper is apposite to the present survey: “The staphylococcus appears to have displaced the pneumococcus as the invader in terminal illness.” The 30 patients with pneumonia are perhaps an illustration of this, but if no staphylococcus had been there would not most of them have succumbed to some other infection? Viewed in this light, this series presents no case for drastic measures of prevention. Precautions which are known to be valuable

in preventing staphylococcal cross-infection differ in feasibility and cost. Those which should always be practicable include efficient sterilization and disinfection, the exclusion of staff with any septic lesion, good aseptic technique, and restrictions on the use of antibiotics. Those sometimes unavailable and expensive to provide are adequate isolation facilities both for infected patients and for those specially susceptible to infection, and ventilation systems which ensure that contaminated air does not reach other parts of the unit. A laboratory service geared to keep constant track of the staphylococcal population among both cases and carriers is perhaps another luxury which not every hospital can afford. A sense of proportion and some willingness to compromise in dealing with this problem will be necessary for some time to come.

The results of a companion study to this one, also conducted by the Public Health Laboratory Service, but by different methods, have recently been reported elsewhere.³ This concerned the acquisition of infection in medical wards in 13 provincial hospitals, and relied on routine laboratory findings, no special bacteriological methods being used. The results emphasize the influence of age and of certain primary diseases in producing susceptibility to hospital infection, which occurred in 345 out of a total of 6,740 patients, and was considered to have contributed to death in 59. There were 110 staphylococcal infections, but only 12 were fatal, 8 of these taking the form of pneumonia; the total figure for pneumonia was 43.

Finally, a study concerned with the mode of spread of staphylococci, by E. A. Mortimer and colleagues, of the Western Reserve School of Medicine, Cleveland, is reported at page 319 of this issue of the *B.M.J.* These authors conducted an ingenious and rigidly controlled experiment in a babies’ nursery which shows that airborne transmission is of much less significance than manual in conveying staphylococci from one baby to another. These findings will be helpful in devising measures to control infection in maternity units, and may well be applicable, with some reservations about the nature of the source of infection, to hospital wards of other kinds.

Surgery for Mental Illness

In a useful review of the surgical treatment of mental illness M. A. Falconer and P. H. Schurr subdivided the modified procedures which have largely replaced the standard prefrontal leucotomy into five groups. These were: local cortical extirpation, cortical undercutting, modified leucotomy, anterior temporal lobectomy, and stereotactic procedures.¹ “These modifications,” they point out, “have aimed at interrupting specific parts of the frontal lobes or their connexions, and at achieving therapeutic effectiveness with the minimum of persistent undesirable effects on the personality.” A measure of the progress which has been made towards gaining anatomical precision is well shown in a recent paper by G. Knight from the Department of Surgery at the Postgraduate Medical School, London.² Knight’s extensive experience with restricted orbital under-

¹ Rogers, D. E., *Ann. intern. Med.*, 1956, **45**, 748.

² Finland, M., Jones, W. F., jun., and Barnes, M. W., *J. Amer. med. Ass.*, 1959, **170**, 2188.

³ Public Health Laboratory Service, *J. Hyg. (Lond.)*, 1965, **63**, 457.

¹ Falconer, M. A., and Schurr, P. H., in *Recent Progress in Psychiatry*, 1959, **3**, 352.

² Knight, G., *J. Neurol. Neurosurg. Psychiat.*, 1965, **28**, 304.

³ Birley, J. L. T., *Brit. J. Psychiat.*, 1964, **110**, 211.

⁴ Report to the Medical Research Council by its Clinical Psychiatry Committee, *Brit. med. J.*, 1965, **1**, 881.

cutting had previously suggested that the area of the substantia innominata might be crucial for the success of the operation. In order to obtain a localized lesion in this region he has gone on to implant radioactive yttrium-90 seeds with a stereotactic device under radiological control. The short range of emanation of these seeds made the technique seem appropriate; electrical and ultrasonic methods may refine it further when the optimal site of the lesion has been established.

How far the operation achieves its therapeutic aim is more difficult to assess. By the yardsticks of mortality and post-operative complications the 90 patients in Knight's series are reported to have done very well, though the impact of the surgical operation on personality and working capacity have still to be assessed in detail. On the central issue of the clinical benefits derived from this complex procedure Knight is refreshingly definite: "The majority of patients suffering from depressive illness can be improved by surgical means when psychiatric treatment fails."

Confirmation of so large a claim would be welcome in view of the distressing and often intractable nature of chronic affective disorders, but the effects of modified leucotomy on the course of these conditions are still controversial. The suggestive but inconclusive nature of the evidence from other studies has been discussed by J. L. T. Birley, who has concluded that "further evaluation of the operation can best be done—perhaps can only be done—by controlled clinical trials."³ A study of this type would demand the collaboration of physicians and surgeons at several centres if results were to be obtained within a reasonable time. The recently published Medical Research Council's clinical trial of treatments of acute depressive illnesses has shown both the feasibility and the value of such studies in this field.⁴ If surgical skill is not to outstrip clinical judgment the case for a controlled, and preferably prospective, investigation is a strong one.

Foetus and Newborn

The time may be coming when the medicine of the unborn foetus will occupy doctors almost as much as the medicine of post-natal life. In a very short time we have passed from regarding congenital malformations or early neonatal death as acts of God to the recognition that they are caused by adverse factors which can be studied and circumvented. Examples are the congenital abnormalities caused by maternal rubella or ingestion of thalidomide, and the death of some babies soon after birth primarily owing to the immaturity of enzyme systems in the lung or liver. Already in intrauterine transfusion of the foetus endangered by rhesus incompatibility we have an example of diagnosis and treatment applied to the unborn. But advances in this new branch of medicine and in the related fields of obstetrics and neonatal paediatrics require new foundations to be laid in studies of the physiology, pharmacology, morbid anatomy, biochemistry, and immunology of the foetus. Following the lead of Barcroft, and his successors such as Huggett and McCance, research workers in Great Britain have made notable advances in the study of the foetus and newborn. In a new issue of the *British Medical Bulletin*¹ recent work in this field is summarized in a series of papers by research workers.

Four of the papers in this issue deal with the problems of placental function and foetal nutrition. In one paper

studies of placental morphometry are shown to provide information of importance to the study of placental transfer. Other papers deal with the requirements of an artificial placenta, with retardation of foetal growth by restriction of placental blood supply, and with the related problems of glycogen stores and hypoglycaemic episodes in newborn infants. A further group of papers is on the development of the central nervous system. They draw attention to the great gaps in our knowledge of this subject, which is particularly important for understanding the causes of mental defect and cerebral palsy. But failure of the respiratory functions of the placenta and lung is probably the commonest cause of cerebral damage near the time of birth, and it is certainly the commonest cause of death. Recent advances in understanding the cardiovascular and pulmonary adjustments which take place at birth are described in articles on the activation of the respiratory centre at birth, the properties of the liquid-air interface created by the first breath, and the responses of the pulmonary and systemic circulations.

As the newborn infant emerges soaking wet into a cold world, he requires the means to increase the production of heat to maintain the temperature of his body. Papers in the present issue deal with the mechanisms of heat regulation in newborn animals and the role of brown fat in the metabolic response to cold. From the earliest times keeping the baby warm has been an important part of baby care, but modern studies have shown that rather precise control of environmental temperature is important in lowering the metabolic needs of premature infants, for their surface is large in relation to their volume and so loss of heat is unduly high, while their equipment for respiratory exchange and assimilation of food can be imperfect.

Many of the problems of the newborn infant arise because the metabolic functions of the placenta are no longer available after birth, and enzyme systems have to develop in order to meet the new needs. The induction of enzyme activity and the development of metabolic pathways is certainly fundamental to many of the problems in the developing foetus. To this important subject the late Dr. Michael Dawkins has contributed a masterly paper which deals with the development of metabolic pathways in the liver. As a foreword rightly states, "Many of his friends will regard this *Bulletin* as a tribute to his memory."

Hospital Costing

The new sections of the hospital costing returns, which have just appeared, add some details to the main ones, which were published in December.¹ They give exact unit costs of departments like catering, laundry, power, medical records, physiotherapy, and of administration, and are intended to encourage finance officers to investigate any apparent excessive expenditure in their own hospitals. The results of the departmental costing are, however, summarized in the main returns, and these do provoke some questions. The average cost of maintaining an in-patient in an acute hospital for a week went up by nearly 8% between 1963-4 and 1964-5: from £33 9s. 6d. to £35 17s. 8d. This is about what one would have expected, having regard to the rise in prices and incomes in that period; most of the cost of main-

¹ *Brit. med. Bull.*, 1966, 22, 1-102.

¹ *Hospital Costing Returns*, Parts 1-3, Ministry of Health, 1965. H.M.S.O.